Remarks

Claims 30-33 and 40 are pending in this application. Claims 1-29 and 34-39 were previously withdrawn in response to a restriction requirement, and claim 40 was previously added.

In the Office Action dated November 17, 2004, the Examiner has withdrawn the rejections of claims 30-32 as being unpatentable over Meyer et al., U.S. Patent No. 5,118,434, and the rejections of claims 30-33 as being unpatentable over Hansen, U.S. Patent No. 4,728,452. The Examiner has stated that the rejection of claims 30-32 under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Maes et al., U.S. Patent No. 5,366,651, is maintained. For the reasons set forth below, Applicants respectfully request reconsideration in view of the amendments to the claims and the arguments set forth below.

Claim 30 has been amended to recite that in the claimed method, the ethylene glycol based, non-aqueous heat transfer fluid contains greater than 60 percent by weight ethylene glycol. As set forth in claims 30-33 as amended and new claim 40, the present invention is directed to a method to reduce the oral toxicity of the ethylene glycol based, non-aqueous heat transfer fluid. A polyhydric alcohol that acts as an ADH enzyme inhibitor is added to the ethylene glycol based, non-aqueous heat transfer fluid containing greater than 60 percent by weight ethylene glycol. As recited in claim 31, in one embodiment of the invention, at least 1 percent by weight of the polyhydric alcohol ADH enzyme inhibitor is added to the ethylene glycol based heat transfer fluid. As recited in claims 32, 33 and new claim 40, in certain embodiments of the invention, the ADH enzyme inhibitor may be propylene glycol or glycerol.

As described in the specification at, inter alia, pages 11-14 and as recited in the amended claims, the method of the present invention results in a non-aqueous heat transfer fluid which is used without the addition of any water. Water is not used in the fluid as a means of heat transfer, and is only present, if at all, in small amounts as an impurity. As described in the specification at, inter alia, pages 17-20, the heat transfer fluids of the mixtures described in the present application exhibit the necessary physical properties, such as, for example, viscosity and vapor pressure, to function effectively in most applications. Moreover, as described in the specification at, inter alia, pages 20-26, the method of the present invention results in a non-aqueous heat transfer fluid which unexpectedly exhibits a reduced oral toxicity than would be predicted based upon the oral toxicity of the major components, such as ethylene glycol or propylene glycol.

The Examiner has reiterated the previous rejections of claims 30-32 under 35 U.S.C. § 102(b) and § 103(a) based upon Maes. On page 3 of the Office Action, the Examiner states that the claims are rejected based upon Maes because "a mere statement of a new use for an old or obvious composition cannot render the claims to the composition patentable." Applicants do not admit that the compositions described in the application are old or obvious, but note that, in any event, the principle stated by the Examiner does not apply to the pending claims in this case. All of the pending claims are directed to a novel method to reduce the toxicity of an ethylene glycol based heat transfer fluid by addition of an ADH enzyme inhibitor, such as, for example, propylene glycol or glycerol. Because the pending claims are not composition claims, this grounds for rejection is respectfully traversed.

The Examiner also states that the Maes reference renders obvious the use of more than one water soluble freezing point depressant in anti-freeze compositions. At col. 3, line 65 to col. 4, line 68, Maes states "The antifreeze formulations most commonly used

include water and water soluble liquid alcohol freezing point depressants such as glycol and glycol ethers." In this sentence, Maes uses glycol in the singular and glycol ethers in the plural, and throughout the specification, Maes describes antifreeze formulations containing a single glycol, indicating that only a single glycol is used in the formulation. Thus, Maes plainly describes the use of a single glycol, and Maes does not teach or suggest any combination of glycols, much less the combination and proportions recited in the claims. For at least this reason, in addition to the reasons set forth in Applicants' August 16, 2004 Response to Office Action in this case, applicants' maintain that Maes does not describe, teach or suggest the combination of more than one glycol freezing point depressant for any reason, much less the addition of a second glycol to a fluid containing ethylene glycol to reduce the oral toxicity of the ethylene glycol-containing fluid as recited in the methods of claims 30-32. For at least this reason, and for the reasons set forth in Applicants' August 16, 2004 Response to Office Action in this case, applicants' maintain that Maes does not describe, teach or suggest the combination of more than one freezing point depressant for any reason, much less for to reduce the toxicity of an ethylene glycol based heat transfer fluid as recited in claims 30-32.

While applicants do not admit that the Examiner's reading of Maes is correct, even under the Examiner's interpretation of Maes, claims 30-32 are patentable under 35 U.S.C. § 102(b) and § 103. To anticipate a claim under 35 U.S.C. § 102(b), each and every element of the claimed invention must be found in a single prior art reference. MPEP § 2131. Maes does not describe a method for reducing the toxicity of an ethylene glycol based, non-aqueous heat transfer fluid by adding an ADH enzyme inhibitor as recited in the amended claims. Moreover, Maes does not describe addition of propylene glycol to an ethylene glycol based, non-aqueous heat transfer fluid in any proportions, much less in the proportions cited in amended claim 30 or claims 31 and 32.

Accordingly, for at least these reasons, Maes does not describe each and every element of claims 30-32 as amended, and these claims are patentable over Maes under 35 U.S.C. § 102(b).

The claims as amended are also patentable over Maes under 35 U.S.C. § 103. Maes does not describe, teach or suggest a method to reduce the toxicity of an ethylene glycol based, non-aqueous heat transfer fluid by addition of an ADH enzyme inhibitor such as propylene glycol as recited in the amended claims. Moreover, Maes does not teach or suggest combining an ethylene glycol based heat transfer fluid in any specific proportions with propylene glycol, much less in the proportions recited in claims 31 and 32. As set forth in the specification, the present inventors discovered that adding an ADH enzyme inhibitor such as propylene glycol in the proportions recited in claims 30-32 to an ethylene glycol based, non-aqueous heat transfer fluid unexpectedly reduced the toxicity of the resulting fluid below the level that would have been predicted based on the properties of the individual fluids.

On page 4 of the Office Action, the Examiner states that the rejection of claims 30-32 based upon Maes is supported because the reduction of oral toxicity is inherent in the anti-freeze fluids described in Maes. While the applicants do not admit that Maes describes the combination of fluids suggested by the Examiner, even if Maes is read in the manner suggested by the Examiner, Maes does not support rejection of claims 30-32 based upon inherency.

Under 35 U.S.C. §102(b), a reference which does not explicitly include all of the limitations of a claim may anticipate if the missing limitation is inherent in the reference. In this case, Maes does not describe any of the steps of the claimed method, and Maes does not describe combining ethylene glycol with an ADH enzyme inhibitor, or with propylene glycol, in the specific proportions recited in claims 30-32 to reduce the oral

toxicity of an ethylene glycol based heat transfer fluid. Accordingly, inherency does not support a rejection under 35 U.S.C. §102(b).

Inherency also does not provide a basis for rejection under 35 U.S.C. §103. Inherency may not be established by probabilities or possibilities. MPEP §2112(IV). Maes does not disclose combinations of ethylene glycol and ADH enzyme inhibitors in the specific proportions recited in claims 30-32 as amended. Thus, even under the Examiner's reading of Maes, it is merely a possibility that the anti-freeze might be reduced in toxicity in the manner recited in the claims. This is insufficient to support the rejection under 35 U.S.C. §103.

The rejection of claims 30-32 under 35 U.S.C. §103 is also improper because Maes does not teach or suggest, inherently or otherwise, the method to reduce the toxicity of an ethylene glycol heat transfer fluid. Maes does not teach or suggest the addition of an ADH enzyme inhibitor, such as propylene glycol or glycerol, to reduce the oral toxicity of an ethylene glycol-based heat transfer fluid.

Finally, Maes is also deficient under 35 U.S.C. §103 because claims 30-32 apply to addition of a specific range of ADH enzyme inhibitor. As set forth in the specification at pages 20-26, the Applicants discovered that addition of at least 1 percent of an ADH enzyme inhibitor such as propylene glycol or glycerol unexpectedly reduced the oral toxicity of non-aqueous, ethylene glycol-based heat transfer fluids. Where as here a claimed range achieves unexpected results, the claimed range is patentable over the prior art. In re Woodruff, 919 F.2d 1575 (Fed. Cir. 1990); MPEP § 2144.05. Accordingly, claims 30-32 are patentable under 35 U.S.C. § 103 over the references cited by the Examiner for at least this additional reason.

Applicants note that the Examiner did not reject either claim 33 or claim 40 based upon Maes in the previous Office Action. Claim 33 recites the addition of glycerol to the ethylene glycol-based heat transfer fluid to reduce the oral toxicity of the fluid, and claim 40 recites the addition of 1% by weight propylene glycol to the ethylene-glycol based heat transfer fluid. These claims are allowable over Maes for at least the reasons discussed for claims 30-32 above.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A Request for Continued Examination and petition for a three month extension of time and associated fee extending the time to respond to Office Action from February 17, 2005 to May 17, 2005 has been filed herewith. No additional fee is believed to be required. However, if an additional fee is required or otherwise necessary to cover any deficiency in fees paid, authorization is hereby given to charge our Deposit Account No. 50-1402.

Respectfully submitted,

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